

(Continued from page 1)  
any nutrients added degrade the TCE to ethylene.

The ESTCP research program, with the partnered efforts of Robins AFB and the others, identified an area just north of the inactive bomber parking area. This area had nearly ideal geochemistry, had a suitable level of TCE contamination along with other chemical species, and was in an area of the base where access for well installation and monitoring could be granted.



A field scale bioremediation set-up similar to this will be used at the Robins AFB site. The Dhc culture for injection is contained in the silver vessel and maintained under nitrogen cover to eliminate oxygen

The naturally occurring microbes being used are of a species known as Dehalococcoides, or Dhc. The specific goals of the work are to determine if the culture of Dhc organisms can migrate from the location at which they are injected and if migrated microbes can colonize in a new location and enhance biodegradation. Also, the study is being designed to determine what nutrients are required to optimize the dechlorination ability, and the role, if any, of other naturally occurring bacteria in the dechlorination zone.

To date the researchers have installed monitoring wells and have performed a pumping test to evaluate flow rates. Also, samples have been taken to determine if Dhc is present already in the soil and groundwater at the site. Design of

June 2004

the injection system has also been completed.

The research program is expected to be completed during late 2005.

#### Glossary

AF	Air Force
AFB	Air Force Base
Dhc	Dehalococcoides microbes
DoD	Department of Defense
EM	Environmental Management Directorate
ERP	Environmental Restoration Program
ESTCP	Environmental Security Technology Certification Program
FY	Fiscal Year
LF	Landfill
PBC	Performance Based Contract
RAB	Restoration Advisory Board
RPO	Remedial Process Optimization
TCE	Trichloroethylene

For more information regarding the RAB, contact  
**Ms. Charline Logue,  
Robins AFB RAB Manager**  
(478) 926-1197, ext. 128

#### Restoration Advisory Board Members

<b>Mr. Steven Coyle, Robins AFB</b> Installation Co-Chair	<b>Dr. Dan Callahan, Warner Robins</b> Community Member	<b>Mr. Mike Maffeo, Macon</b> Community Member
<b>Mr. James Harden, Warner Robins</b> Community Co-Chair	<b>Ms. Marianne Golmitz, Warner Robins</b> Community Member	<b>Dr. M.B. Neace, Macon</b> Community Member
<b>Dr. Dann Spariosu, U.S. EPA Region 4</b> Federal Facility, Hazardous Waste Div.	<b>Mr. John Harley, Centerville</b> Community Member	<b>Dr. Brian E. Rood, Macon</b> Community Member
<b>Ms. Mary Brown, GA EPD</b> Hazardous Waste Management	<b>Dr. Joyce Jenkins, Fort Valley</b> Community Member	<b>Dr. Linda Smyth, Macon</b> Community Member
<b>Mr. Fred Hursey, Robins AFB</b> Chief, Restoration and Resources Div.	<b>Mr. Steve Johnson, Macon</b> Community Member	<b>Dr. Joseph Swartwout, Fort Valley</b> Community Member
	<b>Mr. Broderick Lowe, Warner Robins</b> Community Member	<b>Mr. Don Thompson, Macon</b> Community Member



# Robins Air Force Base Restoration Advisory Board (RAB) Fact Sheet

A publication of Robins AFB

Volume 7, Issue 3, September 2004

## Robins AFB Site Selected for Innovative Research Partnership

**Mr. Jimmy Whitmer** of GeoSyntec Consultants briefed the ongoing innovative research project being conducted near the runway area of the Base. He began by describing the research entity, ESTCP, a DoD group that funds innovative and cutting-edge research programs that show promise for enhancing DoD site remediation projects by decreasing the “cost-to-complete” and shortening the “schedule-to-complete.”



The site selected for field evaluation of enhanced bioremediation under the ESTCP program is located just north of the inactive bomber parking area. Here locations selected for installation of monitoring wells are identified with blue arrows. The wells will be used to track progress of the research effort

## Inside this issue...

ERP Status Update.....	page 2
Robins Wins Environmental Award.....	page 2
Bioremediation Training Session.....	page 3
Glossary .....	page 4
RAB Member List.....	page 4

## September 2004 RAB Meeting

The autumn meeting of the RAB was held on September 9, 2004, at Centerville City Hall, Centerville, Georgia. The theme of this meeting was “Advanced Bioremediation Technologies.” A training session and two briefings were presented. The training topic was “Bioremediation: A Tool for Difficult Sites”. The briefing topics were, “Field Study at Robins AFB: Enhanced Bioremediation for Chemicals in Groundwater,” and “Environmental Restoration Program (ERP) Update.” This RAB Fact Sheet provides a summary of the information and topics discussed in the meeting.

**The next meeting will be held on January 13, 2005.**

In the present project, a collaborative partnership was developed involving Robins AFB, GeoSyntec, and several research universities. The goal of the research was to determine if specialty naturally-occurring microbes, grown in a culture in a laboratory, could be successfully inserted into an area containing groundwater with TCE contamination and could the culture along with

(Continued on page 4)



## ERP Update Briefed: 14 Projects for FY 05 Outlined

**Mr Fred Otto**, Remedial Program Manager, briefed the annual ERP update and discussed the upcoming fiscal year project list. For FY 05, a total of 14 restoration projects have been identified involving a budget of nearly \$7 million. The projects cover a wide variety of restoration-related activities, including manpower, travel/supplies, management, technical support, remedial operations, and long-term monitoring.

The 14 projects scheduled for FY 05 involve activities at 13 restoration sites. A key project continuing in the upcoming year is the remediation project at the Horse Pasture Site. This project is being conducted as a PBC, with the site scheduled for Site Closure by 2009.

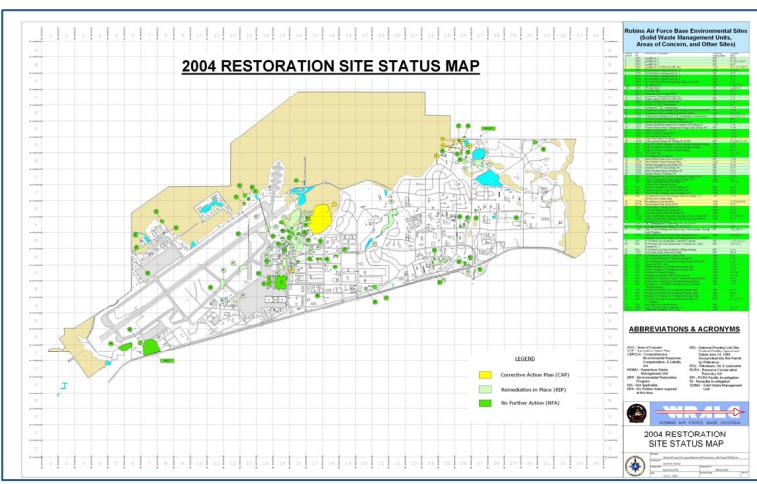


Restoration activities proceed at the Horse Pasture Site, a key project continuing in FY 05

Mr. Otto summarized the outstanding progress made in the restoration program in recent years. He stated that all investigations are complete, with final actions in place at all except one site (Horse Pasture). He indicated that the AF focus on reaching site closure is being supported at Robins AFB by the use of PBC contracts and implementation of RPO activities. He further stated that Robins AFB is exceeding AF metrics for restoration programs. For example, the Base

will have all remedies in place by 2005 (AF goal is 2007), cost-to-complete all sites on Base is being reduced each year, and management costs are below the AF goal of 5 percent.

Mr. Otto mentioned that the remarkable progress made (2004 site status map below) has been accomplished with no interference to Base mission. He further stated that the accelerated clean-up schedule assures that the Base continues to be available for future missions.



## Robins Wins Environmental Protection Magazine Facility of the Year Award

**Mr. Steve Coyle**, Installation Co-chair, announced at the September RAB meeting that the environmental program at Robins AFB has won recognition from a commercially produced national publication. *Environmental Protection Magazine* solicits nominations annually and selects five facilities from across the nation for recognition. The Base was recently notified that its nomination package reflected outstanding accomplishments in a variety of areas, and the Base was being selected as one of the 2004 honorees.

The formal announcement of the competition winners will be made in the October 2004 issue of the magazine. Copies of the magazine honoring Robins AFB will be provided to RAB members at the upcoming meeting.

## RAB Training Session -- Bioremediation as a Tool for Difficult Sites

**Mr. Eric Snider** of GeoSyntec Consultants presented a training session for RAB members. The topic was use of bioremediation for difficult sites, and the briefing served to provide members with background related to the ongoing ESTCP research project at the Base (see page 1).



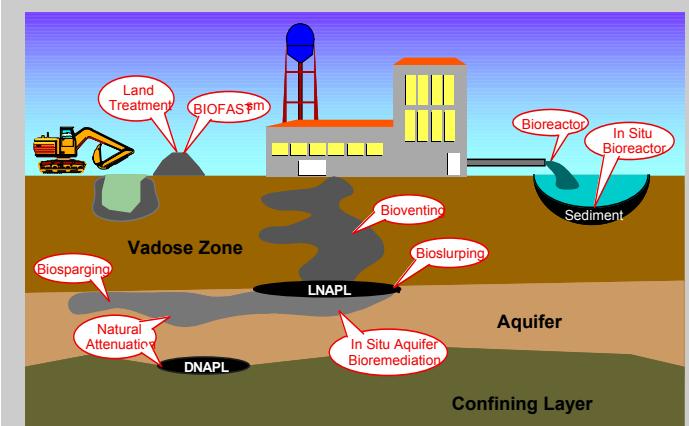
The specialized microbes required to degrade chlorinated chemicals in the subsurface are several strains of Dehalococcoides (Dhc). Dhc occur naturally in the environment in many locations where chlorinated chemicals have been found to be present in the subsurface environment. This map shows locations within the continental United States where Dhc microbes have been found in samples of extracted groundwater.

Mr. Snider began with a summary description of bioremediation as a part of a comprehensive "toolkit" for clean-up of various sites and listed the key ingredients that must be present for naturally occurring microbes to flourish. Necessary ingredients include microbes, a reasonably agreeable environment, something to "breathe," food and water, and time. Both aerobic and anaerobic biodegradation were described. Aerobic degradation occurs in the presence of oxygen and is the primary type of biodegradation that occurs in fuel spill clean-ups. Anaerobic degradation occurs in the absence of oxygen and is the key biodegradation mechanism that occurs in the degradation of chlorinated chemicals in the environment.

As an example, Mr. Snider presented the anaerobic biodegradation sequence for TCE and showed how special microbes (strains of Dhc) must be present for the degradation to proceed to the desirable end product, which is ethylene. These Dhc microbes are known to exist in nature, and a major advancement in research over the past ten years has led scientists to be able to develop commercial cultures containing these organisms.

Research into the behavior of Dhc and similar naturally occurring microbes is ongoing nationwide and includes the ESTCP project underway at Robins AFB, described in a later briefing. The goal of such investigations is to understand how these microbes interact with the environment and contaminants in the subsurface as they work to degrade contaminants. A key advantage of using microbes of this type are that, in addition to their occurring in nature, the reactions in the subsurface are entirely controllable, so that when the contaminants vanish through degradation, the microbes become dormant.

The ultimate goal of all these research efforts is to enhance restoration efforts at sites contaminated with chlorinated chemicals such as TCE. The enhancements can include improved ways of meeting clean-up goals, decreasing cost-to-complete, and accelerating schedule-to-complete.



Biodegradation mechanisms are present in many phases of everyday life and in the natural environment. This graphic shows a number of biological mechanisms that may function at restoration sites.